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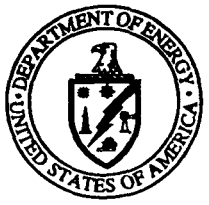


Department of Energy

ROCKY FLATS FIELD OFFICE
P O BOX 928
GOLDEN COLORADO 80402-0928

000064581

NOV 08 1996

96-DOE-03061

Mr Tim Rehder
U S Environmental Protection Agency
999 18th Street, Suite 500
Denver, Colorado 80202-2466

Dear Mr Rehder

The Department of Energy/Rocky Flats Environmental Technology Site (Site) requests approval of the Phase I Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Report for the Woman Creek Priority Drainage Operable Unit Number 5 (OU 5) including the enclosed addendum for the OU 5 RFI/RI Report The RFI/RI addendum was drafted at the request of the U S Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) to clarify specific points that are outlined in the addendum The Site also requests that the CDPHE be consulted and concur with the approval of the complete RFI/RI Report as stated in Section 9, subpart B, paragraph 112 in the Rocky Flats Cleanup Agreement (RFCA)

The Site has addressed in the addendum all the previous comments surrounding the RFI/RI Report. We ask that you respond within 14 days of the signature of this letter to support the acceleration of the Proposed Plan and Corrective Action Decision/Record of Decision (CAD/ROD) for OU 5

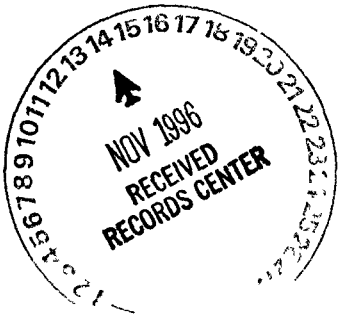
Please contact Pat Newberry at 966-2351 with any questions or comments

Sincerely,

Gail S. Hill

Gail Hill, Acting Group Lead
Regulatory Liaison Group

Enclosure
OU 5 RFI/RI Addendum



ADMIN RECORD

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12.0 Addendum

The purpose of this addendum is to clarify and incorporate information into the Resource Conservation and Recovery Act (RCRA) Facility Investigation/Remedial Investigation (RFI/RI) Report that was requested by both the United States Environmental Protection Agency (EPA) and the Colorado Department of Public Health and Environment (CDPHE) The requested information was compiled from further investigations pertaining to the following topics

- Ingestion risk values using Gastrointestinal Matrix Effect (GIME) Coefficient of 1 0
- Seeps management under the Final Groundwater Conceptual Plan
- Ecological Risk Assessment (ERA) using new radionuclide benchmarks
- Agency for Toxic Substances and Disease Registry (ATSDR) investigation into health risks to off-site receptors, and
- Other previously unincorporated comments

12 1 Ingestion Risks using a GI Matrix Effect Coefficient of 1.0.

In the Human Health Risk Assessment (HHRA), the GI Matrix Effect coefficient (GIME) used for most chemicals of concern (COCs) was 1 0 However, for five of the COCs examined, a GIME of 0 5 was used due to the existence of substantial supporting evidence for the validity of lower GIMEs (Table 6-31 in the RFI/RI report) CDPHE prefers the HHRA to use the more conservative value of 1 0 The risk factors for all examined scenarios were revisited with these GIMEs adjusted to reflect the requested value of 1 0 The five COCs which were re-evaluated are Antimony, Aroclor-1254, Beryllium, Fluoranthene, and Pyrene All other risk values remain as they are presented in Chapter 6 of the Final RFI/RI report

The resulting changes affected the following tables in the RFI/RI Report Tables 6-89 through 6-142 The adjusted tables have been supplied in this addendum as Attachment 12 1A, Adjusted GIME Results The attached tables were numbered to directly correspond to the original tables in the body of the RFI/RI Report. The increase of the GIME did not affect any of the resulting decisions in the RFI/RI report based on the HHRA However, the risks were slightly increased in select cases These cases have been listed in Table 12-1 All the cumulative hazard indices (HIs) for all areas of concern (AOCs) remained below the No Further Remedial Action limit of 1 For AOC 1, the reasonable maximum exposure (RME) cancer risk for the future office worker remained the highest at 3E-05 For AOC 2, the maximum cancer risk is based on the future office worker at 4E-06, which also did not change Therefore, all the risk related conclusions that were drawn from the original calculations are still justified, and no change needs to be made due to the increase in the selected GIME

The Rocky Flats Field Office (RFFO) does not agree with the use of the more conservative value for the GI Matrix Effect for the above mentioned COCs EPA approved toxicity criteria are derived from studies in which the compound is administered in a readily absorbed form For virtually all compounds considered in the Rocky Flats Environmental Technology Site (RFETS) risk assessments, absorption of these compounds when ingested in a soil matrix would be much less than if ingested with a food item RFETS defaults to 1 0 when information is insufficient to support a lower absorption assumption If cited in published literature with a decreased absorption, a conservative assumption of 0 5 is used even if the cited values are much less In the case of Aroclor-1254, there is substantial precedence to use the 0 5 ME, referencing the EPA's polychlorinated biphenyl (PCB) spill policy which uses 0 3 for its "ingestion absorption fraction "

2

12 2 Seeps Management under the Final Groundwater Conceptual Plan

The trace amounts of organic compounds detected in the seep water were found in a groundwater sample (#62893) which was being used to help characterize the seep water This sample was from within the Individual Hazardous Substance Sites (IHSSs) 115 and 196 The organic compounds have been attributed to the leading edge of a VOC plume located within the Industrial Area as shown in Figure 3-1 of the Final Groundwater Conceptual Plan RFETS plans on managing all seeps within the geographical boundaries of OU 5 through the Final Groundwater Conceptual Plan with the goals of protecting surface waters and limiting contaminant migration The seeps do not play a part in the Corrective Action Decision/Record of Decision (CAD/ROD) for OU 5 based on their contaminant levels and on the consolidation of IHSS 115 and 196 within the Industrial Area OU in accordance with the Rocky Flats Clean-up Agreement (RFCA) However, RFFO understands that the management of seeps does play a vital role in the long-term water quality of the ponds within OU 5, and remedial actions will be planned and implemented accordingly Such actions may include source removal and/or seep capture and treatment. These actions will be undertaken consistent with the RFCA and statutory requirements for regulatory review and public comment.

12 3 Ecological Risk Assessment (ERA) with New Radionuclide Benchmarks

A complete description of the development process for the benchmark values of radionuclides in the ERA is reported in Appendix C, *Ecotoxicological Benchmarks for Radionuclide Contaminants at RFETS*, of the Ecological Risk Assessment for Woman Creek and Walnut Creek Watersheds at the Rocky Flats Technology Site which is Appendix N of the OU 5 RFI/RI Report. The development of the benchmarks was conducted by Dr Kathryn Higley, Oregon State University, and Roman Kuperman, Argonne National Laboratory, in 1996 Their results are similar to the benchmark values used in the sitewide ERA presented in the RFI/RI Appendix N, Attachment 2, Table 14 The small variations between the benchmark values and those used in the ERA did not affect the conclusions made for the Woman Creek Drainage

12 4 Agency for Toxic Substance and Disease Registry (ATSDR) Investigation into Health Risks to Off-site Receptors

ATSDR is required under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to complete a health assessment of effects caused by the activities at RFETS The ATSDR health assessment is a sitewide initiative and will include the possibility of off-site receptors affected by dry airborne pond sediment. At present, RFETS is managing the C-1 and C-2 ponds under the Pond Operations Plan which addresses the present and future uses of the ponds The ponds are to be maintained at a high water level for a number of years, thus limiting the amount of airborne sediments Therefore, the possibility of an off-site receptor of dried pond sediment was not examined in the RFI/RI

Any changes in the assumptions made in the evaluation of the health effects from OU 5 will result in the final CAD/ROD being revisited to determine the impacts of those changes This is in addition to the final CAD/ROD being evaluated every five years as required by law During the five year review of the final CAD/ROD, the pond operations at that time will be examined for discrepancies which may invalidate the assumptions leading to the CAD/ROD

12 5 Other Previously Unincorporated Comments

The following statements are short clarifications to the RFI/RI Report to assist in clarifying minor points as requested by the EPA and CDPHE

- As of July 19, 1996, the Rocky Flats Cleanup Agreement (RFCA) was signed between the Department of Energy (DOE)/RFFO, EPA, and CDPHE In RFCA, RFETS was divided into two OUs the Industrial Area and the Buffer Zone In conjunction, selected OUs that were described in the Interagency Agreement (IAG) remained separate due to their position in the CERCLA/RCRA close out process and the amount of study that had already taken place OU 5 was one of the OUs segregated RFCA removed IHSS 115 and 196 (the Original Landfill) from OU 5 and incorporated them into the Industrial Area OU OU 5 can now be considered a low risk site and a No Further Remedial Action (NFRA) candidate as stated in the RFI/RI Report. RFFO intends to issue a Proposed Plan and seek a CAD/ROD for OU 5 based on the analysis and conclusions in the RFI/RI Report
- *(Reference page 1-6, paragraph 3)* For clarification, the estimated amount of combustible waste burned in the incinerator totaled 60 kg Twenty kilograms of the combustible waste ash was disposed of in the original landfill The remaining ash was disposed of in the ash pits with the possibility of some ash being pushed over onto the Concrete Wash Pad The estimated amount of uranium placed in the incinerator was 100 grams The exact fate of the 100 grams of uranium which was placed in the incinerator is not known, but is presumed to be either located in the ash pits or within the Original Landfill
- Table 4-7 has been incorrectly named and should read **Summary of Metal COC's Exceeding Background Mean in Groundwater**
- *(Reference Figure 6-2, COC Selection Process)* In using the Gilbert statistical methodology, an inherent part is the use of professional judgment It is a statistical comparison step in the flow chart
- *(Reference page 5-77, 78, Threshold Wind Speed)* It is a concern by the CDPHE that gusts were not adequately examined in the setup and calibration of the air model In this section, a discussion of average threshold values states that the threshold friction velocity is the minimum velocity which results in any soil movement Therefore, the general assumption is that any wind, sustained or gust, at a lower wind speed than would exceed the threshold friction velocity would not initiate any particulate suspension The air model used the threshold velocities for the OU 3 wind-tunnel study which are more conservative than the rapid-assessment field study estimated threshold velocities for OU 5 as explained in the text

Table 12-1
Results of Alterations to the GI Matrix Effect Coefficients for Select COCs

Scenario and AOC	Initial RMS Risk/HI Value	New RMS Risk/HI Value
Future Open Space User, AOC1	6E-6	7E-6
Future Construction Worker, AOC2	6E-8	8E-8
Current Security Worker, AOC1	0 004	0 005
Future Ecological Researcher, AOC1	0 03	0 04
Future Child Open Space User, AOC1	0 03	0 05
Future Construction Worker, AOC2	0 01	0 02
Future Ecological Researcher, AOC2	0 004	0 006
Future Adult Open Space User, AOC2	0 002	0 004
Future Child Open Space User, AOC2	0 02	0 03

Attachment 12 1A - Adjusted Gastrointestinal Matrix Effect Coefficient Results

Table 6-89
Construction Worker RME Carcinogenic Risks for OU 5 AOC 1

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA
Aroclor 1254	1 3E-08	NA	7 7E-09	NA	2 1E-08
Benzo(a)anthracene	6 8E-09	NA	NA	NA	6 8E 09
Banzo(a)pyrene	6 4E-08	NA	NA	NA	6 4E-08
Benzo(a)fluoranthene	7 1E-09	NA	NA	NA	7 1E 09
Beryllium	2 7E-08	2 7E 13	NA	NA	2 7E-08
Cadmium	NA	1 5E 13	NA	NA	1 5E 13
Copper	NA	NA	NA	NA	NA
Dibenzo(a b)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3 cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
Nonradiological Risk by Pathway					
	1 2E-07	4 2E 13	7 7E-09	NA	
Uranium 233/234	11 E-09	3 1E 10	NA	6 1E 12	1 4E 09
Uranium 235+D	8 8E 11	6 8E 11	NA	2 2E-08	2 2E-08
Uranium 238+D	1 4E 09	3 7E-09	NA	1 3E 07	1 3E 07
Radiological Risks by Pathway					
	2 5E-09	4 0E-09	NA	1 5E 07	
			Total Nonradiological Risk		1 3E 07
			Total Radiological Risk		1 6E 07
			Total Risk		3 0E-0 7

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-90
Current Security Worker RME Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Aroclor 1254	5 2E-08	NA	2 1E-07	NA	2 6E-07
Benzo(a)anthracene	8 6E-09	NA	NA	NA	8 6E-09
Benzo(a)pyrene	6 5E-08	NA	NA	NA	6 5E-08
Benzo(b)fluoranthene	8.7E-09	NA	NA	NA	8 7E-09
Copper	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	4 0E-08	NA	NA	NA	4 0E-08
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2,3-cd)pyrene	1 1E-08	NA	NA	NA	1 1E-08
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	1 8E-07	NA	2 1E-07	NA	
Uranium-233/234	8.3E-09	2.4E-09	NA	5 7E-11	1 1E-08
Uranium-235+D	2 5E-09	5 2E-10	NA	2.0E-07	2.0E-07
Uranium-238+D	9.9E-08	2.8E-08	NA	1 2E-06	1.3E-06
	Radiological Risks by Pathway				
	1 1E-07	3 1E-08	NA	1 4E-06	
			Total Nonradiological Risk.		4 0E-07
			Total Radiological Risk.		1 5E-06
			Total Risk.		2E-06

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6 91
Ecological Worker RME Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	4 6E-08	NA	NA	NA	1 2E-07	NA	NA	NA	1 7E-07
Benzo(a)anthracene	7 6E-09	NA	NA	NA	NA	NA	NA	NA	7 6E-09
Benzo(a)pyrene	5 8E-08	NA	NA	NA	NA	NA	NA	NA	5 8E-08
Benzo(b)fluoranthene	7 7E-09	NA	NA	NA	NA	NA	NA	NA	7 7E-09
Beryllium	NA	1 3E-08	NA	3 1E 12	NA	NA	NA	NA	1 3E-08
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	3 5E-08	NA	NA	NA	NA	NA	NA	NA	3 5E-08
1 1 Dichloroethene	NA	NA	2 0E-09	NA	NA	NA	6 0E-09	NA	8 0E-09
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	9 6E-09	NA	NA	NA	NA	NA	NA	NA	9 6E-09
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 2E-09	NA	NA	NA	8 4E 08	NA	8 5E-08
Trichloroethene	NA	NA	6 5E 11	NA	NA	NA	2 8E-09	NA	2 8E-09
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	1 6E-07	1 3E 08	3 3E-09	3 1E-12	1 2E-07	NA	9 3E-08	NA	
Uranium 233/234	7 3E-09	2 0E 10	NA	1 7E-09	NA	NA	NA	3 1E-11	9 2E-09
Uranium 235+D	2 2E-09	1 6E 11	NA	3 7E-10	NA	NA	NA	1 1E-07	1 1E-07
Uranium 238+D	8 7E 08	2 4E 10	NA	2 0E 08	NA	NA	NA	6 4E-07	7 5E-07
	Radiological Risks by Pathway								
	9 6E-08	4 5E 10	NA	2 2E-08	NA	NA	NA	7 5E-07	
						Total Nonradiological Risk			3 9E-07
						Total Radiological Risk			8 7E-07
						Total Risk.			1E-06

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-92
Office Worker RME Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Aroclor 1254	8.3E-07	NA	2 1E-06	NA	2 9E-06
Benzo(a)anthracene	1 4E-07	NA	NA	NA	1 4E-07
Benzo(a)pyrene	1 0E-06	NA	NA	NA	1 0E-06
Benzo(b)fluoranthene	1 4E-07	NA	NA	NA	1 4E-07
Copper	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	6 4E-07	NA	NA	NA	6 4E-07
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2,3-cd)pyrene	1 7E-07	NA	NA	NA	1 7E-07
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	3 0E-06	NA	2 1E-06	NA	
Uranium-233/234	1.3E-07	3 8E-08	NA	8 6E-10	1 7E-07
Uranium-235+D	4.0E-08	8.4E-09	NA	3 0E-06	3 1E-06
Uranium-238+D	1 6E-06	4 5E-07	NA	1 8E-05	2 0E-05
	Radiological Risks by Pathway				
	1 8E-06	5 0E-07	NA	2 1E-05	
			Total Nonradiological Risk.		5 0E-06
			Total Radiological Risk.		2.3E-05
			Total Risk.		3E-05

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6 93
Open Space User RME Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	2 6E-07	NA	NA	NA	6 3E-07	NA	NA	NA	8 9E-07
Benzo(a)anthracene	4 4E-08	NA	NA	NA	NA	NA	NA	NA	4 4E-08
Benzo(a)pyrene	3 3E-07	NA	NA	NA	NA	NA	NA	NA	3 3E-07
Benzo(b)fluoranthene	4 5E-08	NA	NA	NA	NA	NA	NA	NA	4 5E-08
Beryllium	NA	2 4E-07	NA	9 1E-12	NA	NA	NA	NA	2 4E-07
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	2 0E-07	NA	NA	NA	NA	NA	NA	NA	2 0E-07
1 1 Dichloroethene	NA	NA	3 0E-08	NA	NA	NA	9 0E-08	NA	1 2E-07
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	5 6E-08	NA	NA	NA	NA	NA	NA	NA	5 6E-08
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 8E-08	NA	NA	NA	1 3E-06	NA	1 3E-06
Trichloroethene	NA	NA	9 7E-10	NA	NA	NA	4 1E-08	NA	4 2E-08
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	9 4E-07	2 4E-07	4 9E-08	9 1E-12	6 3E-07	NA	1 4E-06	NA	
Uranium 233/234	1 9E-08	1 7E-09	NA	4 8E-09	NA	NA	NA	1 2E 10	2 6E-08
Uranium 235+D	5 8E-09	1 4E-10	NA	1 1E-09	NA	NA	NA	4 3E-07	4 4E-07
Uranium 238+D	2 3E-07	2 0E 09	NA	5 7E-08	NA	NA	NA	2 6E-06	2 9E-06
	Radiological Risks by Pathway								
	2 5E-07	3 8E-09	NA	6 3E-08	NA	NA	NA	3 0E-06	
							Total Nonradiologicl Risk		3 3E-06
							Total Radiologicl Risk		3 3E-06
							Total Risk		7E-06

"NA" = Not a COC for this pathway or no toxicity factor is available or approrriate for exposure route

Table 6-94
Construction Worker CT Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA
Aroclor 1254	2 3E-09	NA	1 4E-09	NA	3 7E-09
Benzo(a)anthracene	1 2E-09	NA	NA	NA	1 2E-09
Benzo(a)pyrene	1 1E-08	NA	NA	NA	1 1E-08
Benzo(b)fluoranthene	1 3E-09	NA	NA	NA	1 3E-09
Beryllium	4 8E-09	3 0E-14	NA	NA	4 8E-09
Cadmium	NA	1 7E-14	NA	NA	1 7E-14
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1,2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	2 1E-08	4 7E-14	1 4E-09	NA	
Uranium 233/234	1 9E-10	2 5E-10	NA	4 9E-12	4 5E-10
Uranium 235+D	1 6E-11	5 5E-11	NA	1 7E-08	1 7E-08
Uranium 238+D	2 5E-10	2 9E-09	NA	1 0E-07	1 1E-07
	Radiological Risks by Pathway				
	4 5E-10	3 2E-09	NA	1.2E-07	
			Total Nonradiological Risk		2.2E-08
			Total Radiological Risk.		1.2E-07
			Total Risk		1E-07

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

12

Table 6-95
Current Security Worker CT Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Aroclor 1254	1 3E-09	NA	5 3E-09	NA	6 6E-09
Benzo(a)anthracene	2 2E 10	NA	NA	NA	2 2E 10
Benzo(a)pyrene	1 6E-09	NA	NA	NA	1 6E-09
Benzo(b)fluoranthene	2 2E 10	NA	NA	NA	2 2E 10
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	1 0E-09	NA	NA	NA	1 0E-09
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	2 7E 10	NA	NA	NA	2 7E 10
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	4 7E-09	NA	5 3E-09	NA	
Uranium 233/234	2 1E 10	3 3E 10	NA	5 7E-12	5 5E 10
Uranium 235+D	6 3E 11	7 3E 11	NA	2 0E-08	2 0E-08
Uranium 238+D	2 5E-09	4 0E-09	NA	1 2E-07	1 3E-07
	Radiological Risks by Pathway				
	2 8E-09	4 4E-09	NA	1 4E-07	
			Total Nonradiological Risk		1 0E-08
			Total Radiological Risk		1 5E-07
			Total Risk		2E-07

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-96
Ecological Worker CT Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	1 3E-08	NA	NA	NA	2 2E-08	NA	NA	NA	3 5E-08
Benzo(a)anthracene	2 1E-09	NA	NA	NA	NA	NA	NA	NA	2 1E-09
Benzo(a)pyrene	1 6E-08	NA	NA	NA	NA	NA	NA	NA	1 6E-08
Benzo(b)fluoranthene	2 2E-09	NA	NA	NA	NA	NA	NA	NA	2 2E-09
Beryllium	NA	2 1E 09	NA	1 7E 12	NA	NA	NA	NA	2 1E-09
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	9 9E-09	NA	NA	NA	NA	NA	NA	NA	9 9E-09
1 1 Dichloroethene	NA	NA	2 3E 10	NA	NA	NA	3 5E-09	NA	3 7E-09
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	2 7E-09	NA	NA	NA	NA	NA	NA	NA	2 7E-09
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 4E-10	NA	NA	NA	4 9E-08	NA	4 9E-08
Trichloroethene	NA	NA	7 5E-12	NA	NA	NA	1 6E-09	NA	1 6E-09
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	4 6E-08	2 1E-09	3 8E-10	1 7E 12	2 2E-08	NA	5 4E-08	NA	
Uranium 233/234	2 1E-09	3 2E-11	NA	9 0E-10	NA	NA	NA	2 5E 11	3 0E-09
Uranium-235+D	6 2E-10	2 7E-12	NA	2 0E-10	NA	NA	NA	8 6E-08	8 7E-08
Uranium-238+D	2 4E-08	3 9E 11	NA	1 1E-08	NA	NA	NA	5 1E-07	5 5E-07
	Radiological Risks by Pathway								
	2 7E-08	7 4E-11	NA	1 2E-08	NA	NA	NA	6 0E-07	
							Total Nonradiologicl Risk		1 2E-07
							Total Radiologicl Risk		6 4E-07
							Total Risk		8E-07

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-97
Office Worker CT Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Aroclor 1254	1 0E-08	NA	5 2E-08	NA	6 3E-08
Benzo(a)anthracene	1 7E-09	NA	NA	NA	1 7E-09
Benzo(a)pyrene	1 3E-08	NA	NA	NA	1 3E-08
Benzo(b)fluoranthene	1 8E-09	NA	NA	NA	1 8E-09
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	8 1E-09	NA	NA	NA	8 1E-09
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	2 2E-09	NA	NA	NA	2 2E-09
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	3 7E-08	NA	5 2E-08	NA	
Uranium 233/234	1 7E-09	3 6E-09	NA	7 4E-11	5 4E-09
Uranium 235+D	5 0E 10	8 0E 10	NA	2 6E-07	2 6E-07
Uranium 238+D	2 0E-08	4 3E-08	NA	1 5E-06	1 6E-06
	Radiological Risks by Pathway				
	2 2E-08	4 8E-08	NA	1 8E-06	
			Total Nonradiological Risk		9 0E-08
			Total Radiological Risk		1 9E-06
			Total Risk		2E-06

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure routes

Table 6-98
Open Space User CT Carcinogenic Risks for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Acetone	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor 1254	3 1E-08	NA	NA	NA	2 9E-09	NA	NA	NA	3 4E-08
Benzo(a)anthracene	5 2E-09	NA	NA	NA	NA	NA	NA	NA	5 2E-09
Benzo(a)pyrene	4 0E-08	NA	NA	NA	NA	NA	NA	NA	4 0E-08
Benzo(b)fluoranthene	5 3E-09	NA	NA	NA	NA	NA	NA	NA	5 3E-09
Beryllium	NA	3 5E 10	NA	1 9E 13	NA	NA	NA	NA	3 5E-10
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	2 4E-08	NA	NA	NA	NA	NA	NA	NA	2 4E-08
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	6 6E-09	NA	NA	NA	NA	NA	NA	NA	6 6E-09
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	4 6E-10	NA	NA	NA	3 1E-08	NA	3 1E-08
Trichloroethene	NA	NA	2 4E-11	NA	NA	NA	1 0E-09	NA	1 0E-09
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	1 1E-07	3 5E-10	1 2E-09	1 9E-13	2 9E-09	NA	3 4E-08	NA	
Uranium-233/234	1 2E-09	8 5E-11	NA	1 0E-10	NA	NA	NA	1 5E-11	1 4E-09
Uranium-235+D	3 5E-10	7 1E-12	NA	2 3E-11	NA	NA	NA	5 2E-08	5 2E-08
Uranium 238+D	1 4E-08	1 0E-10	NA	1 2E-09	NA	NA	NA	3 1E-07	3 2E-07
	Radiological Risks by Pathway								
	1 5E-08	1 9E-10	NA	1 3E-09	NA	NA	NA	3 6E-07	
							Total Nonradiological Risk.		1 5E-07
							Total Radiological Risk		3 8E-07
							Total Risk		5E-07

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-99
Construction Worker RME Carcinogenic Risks for UO 5, AOC2

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	4 5E-08	4 4E-13	NA	NA	4 5E-08
Cadmium	NA	3 2E-13	NA	NA	3 2E-13
Copper	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Trichloroethene	NA	NA	NA	NA	NA
	Nonradiological Risk by Pathway				
	4 5E-08	7 7E-13	NA	NA	
Uranium-233/234	2 1E-09	2 9E-10	NA	3 3E-12	2 4E-09
Uranium-235+D	4 0E-10	3 7E-11	NA	2 8E-09	3 2E-09
Uranium-238+D	8 1E-09	1 5E-09	NA	2 2E-08	3 1E-08
	Radiological Risks by Pathway				
	1 1E-08	1 8E-09	NA	2 4E-08	
			Total Nonradiological Risk.		4 5E-08
			Total Radiological Risk.		3 7E-08
			Total Risk		8E-08

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

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Table 6-100
Current Security Worker RME Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Benzo(a)pyrene	3.0E-08	NA	NA	NA	3 0E-08
Benzo(b)fluoranthene	5.9E-11	NA	NA	NA	5 9E-11
Copper	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1 0E-09	NA	NA	NA	1 0E-09
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1.5E-10	NA	NA	NA	1 5E-10
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risk by Pathway				
	3 1E-08	NA	NA	NA	
Uranium-233/234	4.5E-09	2.2E-09	NA	4 7E-10	7 2E-09
Uranium-235+D	3.2E-10	2.8E-10	NA	3.9E-07	3.9E-07
Uranium-238+D	1 7E-08	1.2E-08	NA	3.0E-06	3.0E-06
	Radiological Risk by Pathway				
	2.1E-08	1 4E-08	NA	3 4E-06	
			Total Nonradiological Risk.		3 1E-08
			Total Radiological Risk.		3 4E-06
			Total Risk.		3E-06

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route.

Table 6-101
Ecological Worker RME Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	2 6E-08	NA	NA	NA	NA	NA	NA	NA	2 6E-08
Benzo(b)fluoranthene	5 2E-11	NA	NA	NA	NA	NA	NA	NA	5 2E-11
Beryllium	NA	1 1E-08	NA	2 8E-12	NA	NA	NA	NA	1 1E-08
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	8 9E-10	NA	NA	NA	NA	NA	NA	NA	8 9E-10
1 1 Dichloroethene	NA	NA	1 3E-09	NA	NA	NA	3 7E-09	NA	5 0E-09
1,2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	1 3E-10	NA	NA	NA	NA	NA	NA	NA	1 3E-10
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 1E-10	NA	NA	NA	7 5E-09	NA	7 6E-09
Trichloroethene	NA	NA	2 3E-11	NA	NA	NA	9 8E-10	NA	1 0E-09
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risk by Pathway								
	2 7E-08	1 1E-08	1 4E-09	2 8E-12	NA	NA	1 2E-08	NA	
Uranium-233/234	4 0E-09	2 8E-10	NA	1 6E-09	NA	NA	NA	1 7E-11	5 8E-09
Uranium-235+D	2 8E-10	1 9E-11	NA	2 0E-10	NA	NA	NA	1 4E-08	1 4E-08
Uranium 238+D	1 5E-08	7 3E-10	NA	8 1E-09	NA	NA	NA	1 1E-07	1 3E-07
	Radiological Risk by Pathway								
	1 9E-08	1 0E-09	NA	9 8E-09	NA	NA	NA	1 2E-07	
						Total Nonradiological Risk.			5 2E-08
						Total Radiological Risk			1 5E-07
						Total Risk.			2E-07

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-102
Office Worker RME Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Benzo(a)pyrene	4 8E-07	NA	NA	NA	4.8E-07
Benzo(b)fluoranthene	9 4E-10	NA	NA	NA	9 4E-10
Copper	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	1.6E-08	NA	NA	NA	1 6E-08
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	2.4E-09	NA	NA	NA	2.4E-09
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risk by Pathway				-
	5 0E-07	NA	NA	NA	
Uranium-233/234	7.2E-08	3 5E-08	NA	4.7E-10	1 1E-07
Uranium-235+D	5 1E-09	4 5E-09	NA	3 9E-07	4 0E-07
Uranium-238+D	2.7E-07	1 8E-07	NA	3 0E-06	3 5E-06
	Radiological Risk by Pathway				
	3 4E-07	2.2E-07	NA	3 4E-06	
			Total Nonradiological Risk.		5 0E-07
			Total Radiological Risk.		4 0E-06
			Total Risk.		4E-06

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-103
Open Space User RME Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1 5E-07	NA	NA	NA	NA	NA	NA	NA	1 5E-07
Benzo(b)fluoranthene	3 0E-10	NA	NA	NA	NA	NA	NA	NA	3 0E-10
Beryllium	NA	2 2E-07	NA	8 0E-12	NA	NA	NA	NA	2 2E-07
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	5 2E-09	NA	NA	NA	NA	NA	NA	NA	5 2E-09
1 1 Dichloroethene	NA	NA	1 9E-08	NA	NA	NA	5 6E-08	NA	7 5E-08
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	7 5E-10	NA	NA	NA	NA	NA	NA	NA	7 5E-10
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 6E-09	NA	NA	NA	1 1E-07	NA	1 1E-07
Trichloroethene	NA	NA	3 5E-10	NA	NA	NA	1 5E-08	NA	1 5E-08
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risk by Pathway								
	1 6E-07	2 2E-07	2 1E-08	8 0E-12	NA	NA	1 8E-07	NA	
Uranium-233/234	1 0E-08	2 4E-09	NA	4 5E-09	NA	NA	NA	6 7E-11	1 7E-08
Uranium-235+D	7 4E-10	1 6E-10	NA	5 7E-10	NA	NA	NA	5 6E-08	5 7E-08
Uranium-238+D	3 8E-08	6 2E-09	NA	2.3E-08	NA	NA	NA	4 3E-07	5 0E-07
	Radiological Risk by Pathway								
	4 9E-08	8 8E-09	NA	2 8E-08	NA	NA	NA	4 9E-07	
						Total Nonradiological Risk			5 8E-07
						Total Radiological Risk			5 7E-07
						Total Risk			1E-06

NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-104
Construction Worker CT Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	8 0E-09	3 6E 13	NA	NA	8 0E-09
Cadmium	NA	2 6E-13	NA	NA	2 6E-13
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	8 0E-09	6 1E-13	NA	NA	
Uranium-233/234	3 8E-10	2 3E-10	NA	2 7E-12	6 2E-10
Uranium 235+D	7 1E-11	3 0E-11	NA	2.2E-09	2 3E-09
Uranium 238+D	1 4E-09	1 2E-09	NA	1 7E-08	2 0E-08
	Radiological Risks by Pathway				
	1 9E-09	1 5E-09	NA	1 9E-08	
			Total Nonradiological Risk		8 0E-09
			Total Radiological Risk.		2 3E-08
			Total Risk		3E-08

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-105
Current Security Worker CT Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Benzo(a)pyrene	7 5E 10	NA	NA	NA	7 5E 10
Benzo(b)fluoranthene	1 5E 12	NA	NA	NA	1 5E-12
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	2 6E 11	NA	NA	NA	2 6E 11
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	3 7E 12	NA	NA	NA	3 7E 12
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	7 8E 10	NA	NA	NA	
Uranium 233/234	1 1E 10	3 1E 10	NA	4 0E-11	4 6E 10
Uranium 235+D	8 1E 12	3 9E 11	NA	3 3E-08	3 3E-08
Uranium 238+D	4 2E 10	1 6E-09	NA	2 6E-07	2 6E-07
	Radiological Risks by Pathway				
	5 4E 10	2 0E-09	NA	2 9E-07	
			Total Nonradiological Risk		7 8E 10
			Total Radiological Risk		2 9E-07
			Total Risk		3 0E-07

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-106
Ecological Worker CT Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	7 4E-09	NA	NA	NA	NA	NA	NA	NA	7 4E-09
Benzo(b)fluoranthene	1 4E-11	NA	NA	NA	NA	NA	NA	NA	1 4E-11
Beryllium	NA	1 9E-09	NA	1 5E-12	NA	NA	NA	NA	1 9E-09
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	2 5E-10	NA	NA	NA	NA	NA	NA	NA	2 5E-10
1 1 Dichloroethene	NA	NA	1 5E-10	NA	NA	NA	2 2E-09	NA	2 3E-09
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	3 6E-11	NA	NA	NA	NA	NA	NA	NA	3 6E 11
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	1 3E-11	NA	NA	NA	4 4E-09	NA	4 4E-09
Trichloroethene	NA	NA	2 7E-12	NA	NA	NA	5 7E 10	NA	5 8E-10
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	7 7E-09	1 9E-09	1 6E-10	1 5E-12	NA	NA	7 1E-09	NA	
Uranium 233/234	1 1E-09	4 6E-11	NA	8 3E-10	NA	NA	NA	1 3E-11	2 0E-09
Uranium 235+D	7 9E-11	3 2E 12	NA	1 0E-10	NA	NA	NA	1 1E-08	1 1E-08
Uranium 238+D	4 1E-09	1 2E-10	NA	4 3E-09	NA	NA	NA	8 6E-08	9 5E-08
	Radiological Risks by Pathway								
	5 3E-09	1 7E-10	NA	5 3E-09	NA	NA	NA	9 7E-08	
						Total Nonradiological Risk			1 7E-08
						Total Radiological Risk			1 1E-07
						Total Risk			1E-07

NA = no toxicity factor is available or appropriate for exposure route

Table 6-107
Office Worker CT Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total Risk by Chemical
Benzo(a)pyrene	6 0E-09	NA	NA	NA	6 0E-09
Benzo(b)fluoranthene	1 2E 11	NA	NA	NA	1 2E 11
Copper	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	2 0E 10	NA	NA	NA	2 0E 10
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	3 0E 11	NA	NA	NA	3 0E 11
Mercury	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway				
	6 3E-09	NA	NA	NA	
Uranium 233/234	9 1E 10	3 4E-09	NA	4 0E 11	4 3E-09
Uranium 235+D	6 5E 11	4 3E-10	NA	3 3E-08	3 4E-08
Uranium 238+D	3 3E-09	1 8E-08	NA	2 6E-07	2 8E-07
	Radiological Risks by Pathway				
	4 3E-09	2 1E-08	NA	2 9E-07	
			Total Nonradiological Risk		6 3E-09
			Total Radiological Risk		3 2E-07
			Total Risk		3E-07

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-108
Open Space User CT Carcinogenic Risks for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total Risk by Chemical
Antimony	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	1 8E 08	NA	NA	NA	NA	NA	NA	NA	1 8E-08
Benzo(b)fluoranthene	3 6E 11	NA	NA	NA	NA	NA	NA	NA	3 6E 11
Beryllium	NA	2 1E-08	NA	1 7E-13	NA	NA	NA	NA	2 1E-08
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a h)anthracene	6 2E 10	NA	NA	NA	NA	NA	NA	NA	6 2E-10
1 1 Dichloroethene	NA	NA	4 7E 10	NA	NA	NA	1 4E-09	NA	1 8E-09
1 2 Dichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	9 0E-11	NA	NA	NA	NA	NA	NA	NA	9 0E-11
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	4 1E 11	NA	NA	NA	2 8E-09	NA	2 8E-09
Trichloroethene	NA	NA	8 6E-12	NA	NA	NA	3 6E 10	NA	3 7E-10
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	1 9E-08	2 1E-08	5 2E-10	1 7E-13	NA	NA	4 5E-09	NA	
Uranium-233/234	6 3E-10	1 2E-10	NA	9 6E-11	NA	NA	NA	8 0E-12	8 6E-10
Uranium-235+D	4 5E-11	8 4E-12	NA	1 2E-11	NA	NA	NA	6 7E-09	6 7E-09
Uranium 238+D	2 3E-09	3 2E-10	NA	5 0E-10	NA	NA	NA	5 2E-08	5 5E-08
	Radiological Risks by Pathway								
	3 0E-09	4 5E-10	NA	6 1E-10	NA	NA	NA	5 8E-08	
						Total Nonradiological Risk			4 5E-08
						Total Radiological Risk			6 2E-08
						Total Risk			1E-07

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-109
Ecological Worker RME Carcinogenic Risks for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total Risk by Chemical
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
Americium-241	4 7E-10	3 0E-10	3 9E-11	4 4E-12	NA	NA	NA	2 0E-10	1 0E-09
Plutonium 239/240	2 5E-09	1 6E-09	NA	1 7E-11	NA	NA	NA	3 0E-12	4 1E-09
Uranium 233/234	4 6E-10	NA	1 2E-10	NA	NA	NA	NA	NA	5 8E-10
Uranium-235+D	3 1E-11	NA	NA	NA	NA	NA	NA	NA	3 1E-11
Uranium 238+D	5 7E-10	NA	2 0E-10	NA	NA	NA	NA	NA	7 7E-10
	Radiological Risks by Pathway								
	4 0E-09	1 9E-09	3 6E-10	2 2E-11	NA	NA	NA	2 0E-10	
							Total Nonradiological Risk		NA
							Total Radiological Risk		6 5E-09
							Total Risk		7E-09

(1) Includes only contributions from stream sediments

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-110
Open Space User RME Carcinogenic Risks for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total Risk by Chemical
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
Americium-241	4 0E-09	2 6E-09	5 9E-10	1.3E-11	NA	NA	NA	8 0E-10	8 0E-09
Plutonium-239/240	2 1E-08	1 4E-08	NA	5 0E-11	NA	NA	NA	1 2E-11	3 5E-08
Uranium-233/234	3 9E-09	NA	1 9E-09	NA	NA	NA	NA	NA	5 8E-09
Uranium-235+D	2 7E-10	NA	NA	NA	NA	NA	NA	NA	2 7E-10
Uranium-238+D	4 9E-09	NA	2.9E-09	NA	NA	NA	NA	NA	7 8E-09
	Radiological Risks by Pathway								
	3 4E-08	1 6E-08	5 4E-09	6.3E-11	NA	NA	NA	8 1E-10	
							Total Nonradiological Risk.		NA
							Total Radiological Risk.		5 7E-08
							Total Risk.		6E-08

(1) Includes only contributions from stream sediments.
"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-111
Ecological Worker CT Carcinogenic Risks for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1] (mg/kg-day)	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total Risk by Chemical
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
Americium 241	7 7E 11	4 9E 11	4 6E 12	2 3E 12	NA	NA	NA	1 6E 10	2 9E-10
Plutonium 239/240	4 1E 10	2 6E 10	NA	9 3E 12	NA	NA	NA	2 4E 12	6 8E-10
Uranium 233/234	7 5E-11	NA	1 5E 11	NA	NA	NA	NA	NA	9 0E-11
Uranium 235+D	5 1E 12	NA	NA	NA	NA	NA	NA	NA	5 1E-12
Uranium 238+D	9 3E 11	NA	2 3E 11	NA	NA	NA	NA	NA	1 2E-10
	Radiological Risks by Pathway								
	6 6E 10	3 1E 10	4 2E 11	1 2E 11	NA	NA	NA	1 6E 10	
							Total Nonradiological Risk		NA
							Total Radiological Risk		1 2E-09
							Total Risk		1E-09

(1) Includes only contribution from stream sediments

NA = Not a COC for this pathway or no toxicity value available or appropriate for exposure route

Table 6-112
Open Space User CT Carcinogenic Risks for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total Risk by Chemical
Barium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lithium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA	NA	NA
Strontium	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Nonradiological Risks by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
Americium-241	2 0E 10	1 3E-10	1 5E-11	2 7E-13	NA	NA	NA	9 6E-11	4 4E-10
Plutonium-239/240	1 1E-09	7 0E-10	NA	1 1E-12	NA	NA	NA	1 5E-12	1 8E-09
Uranium 233/234	2 0E-10	NA	4 7E-11	NA	NA	NA	NA	NA	2.5E-10
Uranium-235+D	1 4E-11	NA	NA	NA	NA	NA	NA	NA	1 4E-11
Uranium-238+D	2 5E-10	NA	7 4E-11	NA	NA	NA	NA	NA	3 2E-10
	Radiological Risks by Pathway								
	1 7E-09	8 3E-10	1 4E-10	1 3E-12	NA	NA	NA	9 7E 11	
							Total Nonradiological Risk		NA
							Total Radiological Risk		2 8E-09
							Total Risk		3E-09

(1) Includes only contributions from stream sediments

NA = Not a COC for this pathway or no toxicity value available or appropriate for exposure route

Table 6-113
Construction Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total HI by Chemical
Antimony	0 010	NA	NA	NA	0 010
Aroclor 1254	0 006	NA	0 0035	NA	0 01
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	0 00009	NA	NA	NA	0 00009
Cadmium	0 0003	NA	0 00003	NA	0 0004
Copper	0 0006	NA	NA	NA	0 0006
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	0 000000001	NA	NA	0 000000001
Molybdenum	0 003	NA	NA	NA	0 003
Nickel	0 0006	NA	NA	NA	0 001
Pyrene	NA	NA	NA	NA	NA
Silver	0 0003	NA	NA	NA	0 0003
	Nonradiological Hazard Indices by Pathway				
	0 02	0 000000001	0 004	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index		0 02
			Radiological Hazard Index		NA
			Total Hazard Index		0 02

NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-114
Current Security Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Aroclor 1254	0 0009	NA	0 004	NA	0 005
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 00002	NA	NA	NA	0 00002
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	NA	NA	NA
1,2 Dichloroethene	NA	NA	NA	NA	NA
Fluoranthene	0 0000014	NA	NA	NA	0 0000014
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 00001	0 0000000003	NA	NA	0 00001
Pyrene	0 0000017	NA	NA	NA	0 0000017
Silver	0 00001	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway				
	0 0010	0 0000000003	0 004	NA	
Uranium-233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index:		0 005
			Radiological Hazard Index:		NA
			Total Hazard Index:		0 005

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6 115
Ecological Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Acetone	NA	NA	0 00002	NA	NA	NA	0 000002	NA	0 00002
Antimony	NA	0 01	NA	NA	NA	NA	NA	NA	0 01
Aroclor 1254	0 008	NA	NA	NA	0 02	NA	NA	NA	0 03
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 00002	NA	NA	NA	NA	NA	NA	0 00002
Copper	0 0002	NA	NA	NA	NA	NA	NA	NA	0 0002
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 00001	NA	NA	NA	0 00003	NA	0 00004
1 2 Dichloroethene	NA	NA	0 00001	NA	NA	NA	0 00002	NA	0 00003
Fluoranthene	0 000013	NA	NA	NA	NA	NA	NA	NA	0 000013
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 0001	NA	NA	0 000000002	NA	NA	NA	NA	0 0001
Pyrene	0 000015	NA	NA	NA	NA	NA	NA	NA	0 000015
Silver	0 00009	NA	NA	NA	NA	NA	NA	NA	0 00009
Tetrachloroethene	NA	NA	0 00007	NA	NA	NA	0 005	NA	0 005
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 00001	NA	NA	NA	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway								
	0 009	0 006	0 0001	0 000000002	0 02	NA	0 005	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
							Nonradiological Hazard Index		0 04
							Radiological Hazard Index:		NA
							Total Hazard Index		0 04

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-116
Office Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Aroclor 1254	0 015	NA	0 04	NA	0 05
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 0003	NA	NA	NA	0 0003
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 00002	NA	NA	NA	0 00002
Indeno(1 2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 0002	0 000000005	NA	NA	0 0002
Pyrene	0 00003	NA	NA	NA	0 00003
Silver	0 0002	NA	NA	NA	0 0002
	Nonradiological Hazard Indices by Pathway				
	0 016	0 000000005	0 04	NA	
Uranium-233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index:		0 05
			Radiological Hazard Index:		NA
			Total Hazard Index:		0 05

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for this exposure route

Table 6 117
Adult Open Space User RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Acetone	NA	NA	0 00002	NA	NA	NA	0 000002	NA	0 00002
Antimony	NA	0 004	NA	NA	NA	NA	NA	NA	0 004
Aroclor 1254	0 0015	NA	NA	NA	0 010	NA	NA	NA	0 01
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000010	NA	NA	NA	NA	NA	NA	0 000010
Copper	0 00003	NA	NA	NA	NA	NA	NA	NA	0 00003
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 00001	NA	NA	NA	0 00004	NA	0 00005
1 2 Dichloroethene	NA	NA	0 00001	NA	NA	NA	0 00002	NA	0 00004
Fluoranthene	0 000002	NA	NA	NA	NA	NA	NA	NA	0 000002
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 00002	NA	NA	0 000000001	NA	NA	NA	NA	0 00002
Pyrene	0 000003	NA	NA	NA	NA	NA	NA	NA	0 000003
Silver	0 00002	NA	NA	NA	NA	NA	NA	NA	0 00002
Tetrachloroethene	NA	NA	0 00008	NA	NA	NA	0 006	NA	0 00572
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 00001	NA	NA	NA	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway								
	0 0016	0 004	0 0001	0 000000001	0 01	NA	0 006	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Nonradiological Hazard Index			0 02
						Radiological Hazard Index			NA
						Total Hazard Index			0 02

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-118
Child Open Space User RME Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Total HI by Chemical
Antimony	NA	0 04	0 04
Aroclor 1254	0 014	NA	0 014
Benzo(a)anthracene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Beryllium	NA	0 00009	0 00009
Copper	0 0003	NA	0 0003
Dibenzo(a,h)anthracene	NA	NA	NA
Fluoranthene	0 00002	NA	0 00002
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Mercury	0 0002	NA	0 0002
Pyrene	0 00003	NA	0 00003
Silver	0 0001	NA	0 0001
Zinc	NA	0 0001	0 0001
	Nonradiological Hazard Indices by Pathway		
	0 015	0 04	
Uranium-233/234	NA	NA	NA
Uranium-235+D	NA	NA	NA
Uranium-238+D	NA	NA	NA
	Radiological Hazard Indices by Pathway		
	NA	NA	
	Nonradiological Hazard Index:		0 05
	Radiological Hazard Index:		NA
	Total Hazard Index:		0 05

"NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-119
Construction Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total HI by Chemical
Antimony	0 0018	NA	NA	NA	0 0018
Aroclor 1254	0 0011	NA	0 0006	NA	0 002
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	0 00002	NA	NA	NA	0 00002
Cadmium	0 00006	NA	0 000006	NA	0 00007
Copper	0 0001	NA	NA	NA	0 0001
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	0 0000000009	NA	NA	0 0000000009
Molybdenum	0 0005	NA	NA	NA	0 0005
Nickel	0 0001	NA	NA	NA	0 0001
Pyrene	NA	NA	NA	NA	NA
Silver	0 00004	NA	NA	NA	0 00004
	Nonradiological Hazard Indices by Pathway				
	0 004	0 0000000009	0 0006	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0 004
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 004

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-120
Current Security Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Aroclor 1254	0 00015	NA	0 0006	NA	0 0008
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 000003	NA	NA	NA	0 000003
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 0000002	NA	NA	NA	0 0000002
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 000002	0 0000000003	NA	NA	0 000002
Pyrene	0 0000003	NA	NA	NA	0 0000003
Silver	0 000002	NA	NA	NA	0 000002
	Nonradiological Hazard Indices by Pathway				
	0 00016	0 0000000003	0 0006	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0 001
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 001

NA" = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-121
Ecological Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Acetone	NA	NA	0 000002	NA	NA	NA	9 9E 07	NA	0 000003
Antimony	NA	0 0010	NA	NA	NA	NA	NA	NA	0 001041
Aroclor 1254	0 002	NA	NA	NA	0 004	NA	NA	NA	0 01
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000003	NA	NA	NA	NA	NA	NA	NA
Copper	0 00005	NA	NA	NA	NA	NA	NA	NA	0 00005
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 000001	NA	NA	NA	0 00002	NA	0 000019
1 2 Dichloroethene	NA	NA	0 000001	NA	NA	NA	0 00001	NA	0 000012
Fluoranthene	0 000004	NA	NA	NA	NA	NA	NA	NA	0 000004
Indeno(1 2 3 cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 00003	NA	NA	0 000000003	NA	NA	NA	NA	0 00003
Pyrene	0 000004	NA	NA	NA	NA	NA	NA	NA	0 000004
Silver	0 00002	NA	NA	NA	NA	NA	NA	NA	0 00002
Tetrachloroethene	NA	NA	0 000008	NA	NA	NA	0 003	NA	0 002633
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 000002	NA	NA	NA	NA	NA	NA	0 000002
	Nonradiological Hazard Indices by Pathway								
	0 002	0 0010	0 00001	0 000000003	0 004	NA	0 003	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Total Nonradiological Hazard Index			0 01
						Total Radiological Hazard Index			NA
						Total Hazard Index			0 01

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure routes

Table 6-122
Office Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Aroclor 1254	0 0012	NA	0 006	NA	0 007
Benzo(a)anthracene	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 00003	NA	NA	NA	0 00003
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 0000018	NA	NA	NA	0 0000018
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0.00002	0 000000003	NA	NA	0 00002
Pyrene	0 000002	NA	NA	NA	0 000002
Silver	0.00001	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway				
	0 0012	0 000000003	0 006	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0.007
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 007

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

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Table 6-123
Adult Open Space User CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Acetone	NA	NA	0 000002	NA	NA	NA	0 0000002	NA	0 000002
Antimony	NA	0 0006	NA	NA	NA	NA	NA	NA	0 0006
Aroclor 1254	0 0003	NA	NA	NA	0 0001	NA	NA	NA	0 0004
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000002	NA	NA	NA	NA	NA	NA	0 0000017
Copper	0 000007	NA	NA	NA	NA	NA	NA	NA	0 000007
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 000001	NA	NA	NA	0 000003	NA	0 000004
1 2 Dichloroethene	NA	NA	0 000001	NA	NA	NA	0 000002	NA	0 000003
Fluoranthene	0 0000005	NA	NA	NA	NA	NA	NA	NA	0 0000005
Indeno(1 2 3 cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 000004	NA	NA	0 0000000004	NA	NA	NA	NA	0 000004
Pyrene	0 0000006	NA	NA	NA	NA	NA	NA	NA	0 0000006
Silver	0 000003	NA	NA	NA	NA	NA	NA	NA	0 000003
Tetrachloroethene	NA	NA	0 000007	NA	NA	NA	0 0005	NA	0 0005
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 000001	NA	NA	NA	NA	NA	NA	0 000001
	Nonradiological Hazard Indices by Pathway								
	0 0003	0 0006	0 00001	0 0000000004	0 0001	NA	0 0005	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
					Total Nonradiological Hazard Index				0 002
					Total Radiological Hazard Index				NA
					Total Hazard Index				0 002

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

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Table 6-124
Child Open Space User CT Noncarcinogenic Hazard Indices for OU 5, AOC1

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Total HI by Chemical
Acetone	NA	NA	NA
Antimony	NA	0 006	0 006
Aroclor 1254	0 003	NA	0 003
Benzo(a)anthracene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Beryllium	NA	0 00002	0 000016
Copper	0 00006	NA	0 00006
Dibenzo(a h)anthracene	NA	NA	NA
1 1 Dichloroethene	NA	NA	NA
1 2 Dichloroethene	NA	NA	NA
Fluoranthene	0 000004	NA	0 000004
Indeno(1 2 3-cd)pyrene	NA	NA	NA
Mercury	0 00004	NA	0 00004
Pyrene	0 000005	NA	0 000005
Silver	0 00003	NA	0 00003
Tetrachloroethene	NA	NA	NA
Trichloroethene	NA	NA	NA
Zinc	NA	0 00001	0 00001
Nonradiological Hazard Indices by Pathway			
	0 003	0 006	
Uranium 233/234	NA	NA	NA
Uranium-235+D	NA	NA	NA
Uranium 238+D	NA	NA	NA
Radiological Hazard Indices by Pathway			
	NA	NA	
	Total Nonradiological Hazard Index		0 009
	Total Radiological Hazard Index		NA
	Total Hazard Index		0 009

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-125
Construction Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total HI by Chemical
Antimony	0 013	NA	NA	NA	0 013
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	0 00015	NA	NA	NA	0 00015
Cadmium	0 0007	NA	0 00007	NA	0 0008
Copper	0 0006	NA	NA	NA	0 0006
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	0 0000000000006	NA	NA	0 0000000000006
Molybdenum	0 002	NA	NA	NA	0 002
Nickel	0 0006	NA	NA	NA	0 0006
Pyrene	NA	NA	NA	NA	NA
Silver	0 0005	NA	NA	NA	0 0005
	Nonradiological Hazard Indices by Pathway				
	0 02	0 0000000000006	0 00007	NA	
Uranium-233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index:		0 02
			Radiological Hazard Index:		NA
			Total Hazard Index:		0 02

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-126
Current Security Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 00001	NA	NA	NA	0 00001
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 00000007	NA	NA	NA	0 00000007
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 000008	0.0000000000002	NA	NA	0 000008
Pyrene	0 00000011	NA	NA	NA	0 00000011
Silver	0 00001	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway				
	0 00003	0 0000000000002	NA	NA	
Uranium-233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index:		0.00003
			Radiological Hazard Index:		NA
			Total Hazard Index:		0 00003

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route.

Table 6-127
Ecological Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Antimony	NA	0 005	NA	NA	NA	NA	NA	NA	0 005
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 00001	NA	NA	NA	NA	NA	NA	0 000015
Copper	0 0001	NA	NA	NA	NA	NA	NA	NA	0 0001
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 000007	NA	NA	NA	0 00002	NA	0 00003
1,2 Dichloroethene	NA	NA	0 000007	NA	NA	NA	0 00001	NA	0 00002
Fluoranthene	0 0000006	NA	NA	NA	NA	NA	NA	NA	0 0000006
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 00007	NA	NA	0 000000000001	NA	NA	NA	NA	0 00007
Pyrene	0 0000010	NA	NA	NA	NA	NA	NA	NA	0 0000010
Silver	0 00008	NA	NA	NA	NA	NA	NA	NA	0 00008
Tetrachloroethene	NA	NA	0 000006	NA	NA	NA	0 0004	NA	0 0004
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 0002	NA	NA	NA	NA	NA	NA	0 0002
	Nonradiological Hazard Indices by Pathway								
	0 0003	0 006	0 00002	0 000000000001	NA	NA	0 0004	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Nonradiological Hazard Index			0 006
						Radiological Hazard Index			NA
						Total Hazard Index.			0 006

"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-128
Office Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC2

	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 0002	NA	NA	NA	0 0002
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 0000011	NA	NA	NA	0 0000011
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 0001	0 000000000003	NA	NA	0 0001
Pyrene	0 0000017	NA	NA	NA	0 0000017
Silver	0 0002	NA	NA	NA	0 0002
	Nonradiological Hazard Indices by Pathway				
	0 0005	0 000000000003	NA	NA	
Uranium-233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
			Nonradiological Hazard Index:		0 0005
			Radiological Hazard Index:		NA
			Total Hazard Index:		0 0005

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route.

Table 6 129
Adult Open Space User RME Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Antimony	NA	0 003	NA	NA	NA	NA	NA	NA	0 003
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000009	NA	NA	NA	NA	NA	NA	0 000009
Copper	0 00002	NA	NA	NA	NA	NA	NA	NA	0 00002
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 000008	NA	NA	NA	0 00002	NA	0 00003
1 2 Dichloroethene	NA	NA	0 000008	NA	NA	NA	0 00002	NA	0 00002
Fluoranthene	0 00000011	NA	NA	NA	NA	NA	NA	NA	0 0000001
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 00001	NA	NA	0 0000000000003	NA	NA	NA	NA	0 00001
Pyrene	0 00000017	NA	NA	NA	NA	NA	NA	NA	0 0000002
Silver	0 00002	NA	NA	NA	NA	NA	NA	NA	0 00002
Tetrachloroethene	NA	NA	0 000007	NA	NA	NA	0 0005	NA	0 0005
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 0001	NA	NA	NA	NA	NA	NA	0 0001
	Nonradiological Hazard Indices by Pathway								
	0 00005	0 003	0 00002	0 0000000000003	NA	NA	0 0005	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Nonradiological Hazard Index			0 004
						Radiological Hazard Index*			NA
						Total Hazard Index*			0 004

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-130
Child Open Space User RME Noncarcinogenic Hazard Indcies for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Total HI by Chemical
Antimony	NA	0.03	0.03
Aroclor 1254	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Beryllium	NA	0 00008	0 00008
Copper	0 0002	NA	0 0002
Dibenzo(a,h)anthracene	NA	NA	NA
Fluoranthene	0 0000010	NA	0 0000010
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Mercury	0 0001	NA	0 0001
Pyrene	0 0000016	NA	0 0000016
Silver	0.0001	NA	0 0001
Zinc	NA	0 001	0 001
	Nonradiological Hazard Indices by Pathway		
	0 0005	0 03	
Uranium-233/234	NA	NA	NA
Uranium-235+D	NA	NA	NA
Uranium-238+D	NA	NA	NA
	Radiological Hazard Indices by Pathway		
	NA	NA	
	Nonradiological Hazard Index:		0 03
	Radiological Hazard Index:		NA
	Total Hazard Index:		0 03

*NA = Not a COC for this pathway or no toxicity factor is available or appropriatefor exposure route

Table 6-131
Construction Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Subsurface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Subsurface Soil	External Radiation Exposure	Total HI by Chemical
Antimony	0 002	NA	NA	NA	0 002
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Beryllium	0 00003	NA	NA	NA	0 00003
Cadmium	0 0001	NA	0 00001	NA	0 0001
Copper	0 0001	NA	NA	NA	0 0001
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	NA	0 0000000000005	NA	NA	0 0000000000005
Molybdenum	0 0004	NA	NA	NA	0 0004
Nickel	0 0001	NA	NA	NA	0 0001
Pyrene	NA	NA	NA	NA	NA
Silver	0 00009	NA	NA	NA	0 00009
	Nonradiological Hazard Indices by Pathway				
	0 003	0 0000000000005	0 00001	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0 003
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 003

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for esposure route

Table 6-132
Current Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 000002	NA	NA	NA	0 000002
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0 000000011	NA	NA	NA	0 000000011
Indeno(1 2 3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 000001	0 0000000000002	NA	NA	0 000001
Pyrene	0 000000017	NA	NA	NA	0 000000017
Silver	0 000002	NA	NA	NA	0 000002
	Nonradiological Hazard Indices by Pathway				
	0 000005	0 0000000000002	NA	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0 000005
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 000005

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for this exposure route

Table 6-133
Ecological Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Antimony	NA	0 0009	NA	NA	NA	NA	NA	NA	0 0009
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000002	NA	NA	NA	NA	NA	NA	0 000002
Copper	0 00003	NA	NA	NA	NA	NA	NA	NA	0 00003
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 0000008	NA	NA	NA	0 00001	NA	0 00001
1 2 Dichloroethene	NA	NA	0 0000008	NA	NA	NA	0 000007	NA	0 000008
Fluoranthene	0 00000017	NA	NA	NA	NA	NA	NA	NA	0 00000017
Indeno(1 2 3 cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 00002	NA	NA	0 000000000001	NA	NA	NA	NA	0 00002
Pyrene	0 0000003	NA	NA	NA	NA	NA	NA	NA	0 0000003
Silver	0 00002	NA	NA	NA	NA	NA	NA	NA	0 00002
Tetrachloroethene	NA	NA	0 0000007	NA	NA	NA	0 0002	NA	0 0002
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 00003	NA	NA	NA	NA	NA	NA	0 00003
	Nonradiological Hazard Indices by Pathway								
	0 00008	0 0009	0 000002	0 000000000001	NA	NA	0 0003	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
					Total Nonradiological Hazard Index				0 0012
					Total Radiological Hazard Index				NA
					Total Hazard Index				0 0012

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

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Table 6-134
Office Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC2

	Ingestion of Surface Soil	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	External Radiation Exposure	Total HI by Chemical
Benzo(a)pyrene	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA
Copper	0 00002	NA	NA	NA	0 00002
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA
Fluoranthene	0.00000009	NA	NA	NA	0 00000009
Indeno(1 2,3-cd)pyrene	NA	NA	NA	NA	NA
Mercury	0 00001	0 000000000002	NA	NA	0 00001
Pyrene	0 00000014	NA	NA	NA	0 00000014
Silver	0 00001	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway				
	0 00004	0 000000000002	NA	NA	
Uranium 233/234	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway				
	NA	NA	NA	NA	
		Total Nonradiological Hazard Index			0 00004
		Total Radiological Hazard Index			NA
		Total Hazard Index			0 00004

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

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Table 6-135
Adult Open Space User CT Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Ingestion of Seep Water	Inhalation of Airborne Particulates	Dermal Absorption of Surface Soil	Dermal Absorption of Seep Sediments	Dermal Absorption of Seep Water	External Radiation Exposure	Total HI by Chemical
Antimony	NA	0 0005	NA	NA	NA	NA	NA	NA	0 0005
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	0 000001	NA	NA	NA	NA	NA	NA	0 000001
Copper	0 000004	NA	NA	NA	NA	NA	NA	NA	0 000004
Dibenzo(a h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA
1 1 Dichloroethene	NA	NA	0 0000007	NA	NA	NA	0 000002	NA	0 000003
1 2 Dichloroethene	NA	NA	0 0000007	NA	NA	NA	0 000001	NA	0 000002
Fluoranthene	0 00000002	NA	NA	NA	NA	NA	NA	NA	0 00000002
Indeno(1 2 3 cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0 000003	NA	NA	0 00000000000002	NA	NA	NA	NA	0 000003
Pyrene	0 00000003	NA	NA	NA	NA	NA	NA	NA	0 00000003
Silver	0 000003	NA	NA	NA	NA	NA	NA	NA	0 000003
Tetrachloroethene	NA	NA	0 0000006	NA	NA	NA	0 00004	NA	0 00004
Trichloroethene	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	0 00002	NA	NA	NA	NA	NA	NA	0 00002
	Nonradiological Hazard Indices by Pathway								
	0 00001	0 0006	0 000002	0 00000000000002	NA	NA	0 00004	NA	
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
					Total Nonradiological Hazard Index				0 0006
					Total Radiological Hazard Index				NA
					Total Hazard Index				0 0006

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-136
Child Open Space User CT Noncarcinogenic Hazard Indices for OU 5, AOC2

Chemicals of Concern	Ingestion of Surface Soil	Ingestion of Seep Sediments	Total HI by Chemical
Antimony	NA	0 005	0 005
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Beryllium	NA	0 000014	0 000014
Copper	0 00004	NA	0 00004
Dibenzo(a h)anthracene	NA	NA	NA
Fluoranthene	0 0000002	NA	0 0000002
Indeno(1 2 3-cd)pyrene	NA	NA	NA
Mercury	0 00002	NA	0 00002
Pyrene	0 0000003	NA	0 0000003
Silver	0 00003	NA	0 00003
Zinc	NA	0 0002	0 0002
	Nonradiological Hazard Indices by Pathway		
	0 00010	0 005	
Uranium-233/234	NA	NA	NA
Uranium 235+D	NA	NA	NA
Uranium-238+D	NA	NA	NA
	Radiological Hazard Indices by Pathway		
	NA	NA	
	Total Nonradiological Hazard Index		0 005
	Total Radiological Hazard Index		NA
	Total Hazard Index		0 005

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-137
Ecological Worker RME Noncarcinogenic Hazard Indices for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total HI by Chemical
Barium	NA	NA	0 00003	NA	NA	NA	NA	NA	0 00003
Copper	NA	0 0003	NA	NA	NA	NA	NA	NA	0 0003
Lithium	NA	NA	0 00003	NA	NA	NA	NA	NA	0 00003
Mercury	0 0003	0 0004	NA	0 0000002	NA	NA	NA	NA	0 0006
Strontium	NA	NA	0 00001	NA	NA	NA	NA	NA	0 00001
Zinc	0 00004	0 0001	NA	NA	NA	NA	NA	NA	0 0001
	Nonradiological Hazard Indices by Pathway								
	0 0003	0 001	0 00007	0 0000002	NA	NA	NA	NA	
Americium-241	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium 239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Total Nonradiological Hazard Index			0 001
						Total Radiological Hazard Index			NA
						Total Hazard Index			0 001

(1) Includes only contribution of stream sediments

NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-138
Adult Open Space User RME Noncarcinogenic Hazard Indices for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total Risk by Chemical
Barium	NA	NA	0 00004	NA	NA	NA	NA	NA	0 00004
Copper	NA	0 0002	NA	NA	NA	NA	NA	NA	0 0002
Lithium	NA	NA	0 00003	NA	NA	NA	NA	NA	0 00003
Mercury	0 0002	0 0002	NA	0 00000004	NA	NA	NA	NA	0 0004
Strontium	NA	NA	0 00002	NA	NA	NA	NA	NA	0 00002
Zinc	0 00002	0 00006	NA	NA	NA	NA	NA	NA	0 00008
	Nonradiological Hazard Indices by Pathway								
	0 0002	0 0004	0 00009	0 00000004	NA	NA	NA	NA	
Americium-241	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium-239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium-238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Total Nonradiological Hazard Index:			0 0007
						Total Radiological Hazard Index:			NA
						Total Hazard Index:			0 0007

(1) Includes only contributions of stream sediments.
"NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route.

Table 6-139
Child Open Space User RME Noncarcinogenic Hazard Indices for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Total Risk by Chemical
Copper	NA	0 001	0 001
Mercury	0 001	0 002	0 003
Zinc	0 0002	0 0005	0 0008
	Nonradiological Hazard Indices by Pathway		
	0 002	0 004	
Americium 241	NA	NA	NA
Plutonium 239/240	NA	NA	NA
Uranium 233/234	NA	NA	NA
Uranium 235+D	NA	NA	NA
Uranium-238+D	NA	NA	NA
	Radiological Hazard Indices by Pathway		
	NA	NA	
	Total Nonradiological Hazard Index		0 006
	Total Radiological Hazard Index*		NA
	Total Hazard Index:		0 006

*NA = Not a COC for this pathway or no toxicity factor is available or appropriate for exposure route

Table 6-140
Ecological Worker CT Noncarcinogenic Hazard Indices for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total HI by Chemical
Barium	NA	NA	0 000004	NA	NA	NA	NA	NA	0 000004
Copper	NA	0 00004	NA	NA	NA	NA	NA	NA	0 00004
Lithium	NA	NA	0 000003	NA	NA	NA	NA	NA	0 000003
Mercury	0 00004	0 00006	NA	0 00000008	NA	NA	NA	NA	0 0001
Strontium	NA	NA	0 000001	NA	NA	NA	NA	NA	0 000001
Zinc	0 000006	0 00002	NA	NA	NA	NA	NA	NA	0 00002
		Nonradiological Hazard Indices by Pathway							
	0 00005	0 0001	0 000008	0 00000008	NA	NA	NA		
Americium 241	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium 239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
		Radiological Hazard Indices by Pathway							
	NA	NA	NA	NA	NA	NA	NA	NA	
						Total Nonradiological Hazard Index			0 0002
						Total Radiological Hazard Index			NA
						Total Hazard Index			0 0002

(1) Includes only contributions of stream sediments

NA = Not a COC for this pathway or no toxicity value available or appropriate for exposure route

Table 6-141
Adult Open Space User CT Noncarcinogenic Hazard Indices for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Ingestion of Surface Water	Inhalation of Airborne Particulates[1]	Dermal Absorption of Pond Sediments	Dermal Absorption of Stream Sediments	Dermal Absorption of Surface Water	External Radiation Exposure	Total HI by Chemical
Barium	NA	NA	0 000004	NA	NA	NA	NA	NA	0 000004
Copper	NA	0 00003	NA	NA	NA	NA	NA	NA	0 00003
Lithium	NA	NA	0 000003	NA	NA	NA	NA	NA	0 000003
Mercury	0 00003	0 00004	NA	0 000000003	NA	NA	NA	NA	0 00006
Strontium	NA	NA	0 000001	NA	NA	NA	NA	NA	0 000001
Zinc	0 000004	0 00001	NA	NA	NA	NA	NA	NA	0 00001
	Nonradiological Hazard Indices by Pathway								
	0 00003	0 0001	0 000008	0 000000003	NA	NA	NA	NA	
Americium 241	NA	NA	NA	NA	NA	NA	NA	NA	NA
Plutonium 239/240	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 233/234	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 235+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
Uranium 238+D	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Radiological Hazard Indices by Pathway								
	NA	NA	NA	NA	NA	NA	NA	NA	
						Total Nonradiological Hazard Index			0 0001
						Total Radiological Hazard Index			NA
						Total Hazard Index			0 0001

(1) Includes only contribution of stream sediments

NA = Not a COC for this pathway or no toxicity value available or appropriate for exposure route

Table 6-142
Child Open Space User CT Noncarcinogenic Hazard Indicess for OU 5, AOC3

Chemicals of Concern	Ingestion of Pond Sediments	Ingestion of Stream Sediments	Total HI by Chemical
Copper	NA	0 00007	0 00007
Mercury	0 00007	0 00010	0 0002
Zinc	0 00001	0 00003	0 00004
	Nonradiological Hazard Indices by Pathway		
	0 0001	0 0002	
Americium-241	NA	NA	NA
Plutonium 239/240	NA	NA	NA
Uranium-233/234	NA	NA	NA
Uranium 235+D	NA	NA	NA
Uranium-238+D	NA	NA	NA
	Radiological Hazard Indices by Pathway		
	NA	NA	
	Total Nonradiological Hazard Index		0 0003
	Total Radiological Hazard Index		NA
	Total Hazard Index		0 0003

NA = Not a COC for this pathway or no toxicity value available or appropriate for exposure route